BM

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/072,412	05/04/1998	STEPHEN R. SCHWARTZ	15381	6519

7590 07/25/2005

KENYON & KENYON
333 WEST SAN CARLOS STREET
SUITE 600
SAN JOSE, CA 95110

EXAMINER	
PENDLETON, BRIAN T	
ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 07/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

MAILED

JUL 2 2 2005

Technology Center 2600

Application Number: 09/072,412
Filing Date: May 04, 1998
Appellant(s): SCHWARTZ, STEPHEN R.

Shawn O'Dowd
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 14, 2005 appealing from the Office action mailed July 14, 2004.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

The amendment after final rejection filed on December 20, 2004 has been entered.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-5, 13-15 and 28-32 and 36-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartlett in view of Murayama et al. Bartlett discloses a method for altering the sound of a close miked acoustic instrument (e.g. guitar, piano) to make it sound more natural. The method consists of playing sounds from the instrument when said instrument is closely miked (figure 2) and comparing the spectra of the picked up sound to reference sounds. The reference sounds are the sounds generated by the instrument and heard 1 meter away. These sounds were determined to have well-balanced timbre. See figure 1. The difference between the closely miked and reference sounds are shown in figure 4 (and figures 5-15 for various microphone positions). Therefore, differences in level over the audible frequency range were determined. As taught in section 2, to make the instrument sound "well balanced" when miked up close, the instrument can be equalized. Also in section 5, it was suggested that the inverse of the spectral curve shown in the figures is the equalization required to make a close-mike instrument sound as it does at the reference point (1 meter away). Thus, steps 1 through 6 are taught by Bartlett: a selected location proximate to an acoustical generator is determined and a microphone is placed at the location (figure 2), sounds are generated by the acoustical generator and picked up by the microphone, reference sounds of the acoustic generator are played (figure 1) and the sounds picked up by the microphone in figure 2 is compared to the reference sounds (figure 4). Differences in level over the audible frequency range was determined for the sound picked up by the microphone in figure 2 and the reference sounds (also in figure 4). Bartlett does not explicitly state assembling a first filter element for compensating for a first difference in the sounds in a first discrete frequency range and assembling a second filter element for

compensating for a second difference in the sounds in a second discrete frequency range and constructing an equalizer using the first and second filter elements, per claim 1. However, those method steps were obvious to one of ordinary skill in the art at the time of invention according to the following explanation.

Bartlett suggests that the inverse of the spectral curves shown in figures 4-15 is the equalization needed to make a closely miked instrument sound like the reference sounds. For one of ordinary skill in the art, it was well known that the inverse of the curves can be realized by using an equalizer. An equalizer adjusts the gains in discrete frequency ranges so that an output signal can be shaped according to a specific spectral function. As evidence, see Murayama et al, columns 1 and 2. Murayama et al state that for adjusting the sound quality of an audio signal depending on the playback sound field, a graphic equalizer circuit for splitting the frequency spectrum into plural bands and for changing the gain in each of the split bands is used extensively. Accordingly, with this teaching, which demonstrated a well known practice in the art, one would have been motivated to use a graphic equalizer to correct for the differences in the closely miked sounds and reference sounds. Although Bartlett proposed a low pass filter with a cut-off frequency around 300 Hz as a compensator in figure 16, that was just one example. As one of ordinary skill in the art could see, figure 16 only compensates for the sound below 300 Hz. The sound above that cut-off level still is not compensated for. An inverse curve is not used, thereby yielding some lingering differences in the mid-range and treble ranges. It would have been obvious at the time of invention to also include those frequency ranges in the compensation process to yield the sound closest to the reference sound. Naturally, one of ordinary skill would not only compensate in one frequency range. For instance, a piano contains

a plurality of keys, to compensate for only one of those keys would not produce the reference sound or any sound close to it. Therefore, to have a true reference sound produced from the closely miked instrument, more than one frequency range had to be considered. As shown in Murayama et al, figures 2 and 3, the graphic equalizer has a plurality of frequency ranges, some of which are discrete from one another (e.g. ranges centered around f_1 and f_3). The bandpass filters 31A, 31B, etc. determine the center frequency and the voltage-current converters, elements 32 and 33, determine the gain. Applying the teachings of Murayama et al, per equalizers and sound adjustment, to the Bartlett reference, it would have been obvious to one of ordinary skill in the art at the time of invention to use the graphic equalizer of Murayama et al, which disclose first and second filter elements with first and second discrete frequency ranges, to achieve the inverse spectral curve of the differences between the sounds of the closely miked acoustical generator and the reference sounds. Claim 1 is met. As to claim 2, Bartlett suggests a plurality of test positions of the closely miked guitar. Without undue experimentation, one of ordinary skill in the art would have attached the microphone to the instrument, as was done for acoustical performances at the time of invention. Regarding claims 3 and 4, section 3 of Bartlett discloses that musicians and audio engineers were asked to describe the differences between the closely miked instrument and the reference sound for the test positions. Their comments are shown next to the difference curves in the figures. Thus, it was taught that the naked ear could be used to compare the sounds picked up by the microphone and the reference sounds. As a result, the listener could then manipulate a graphic equalizer to make up for the difference in sounds. Per claim 5, Bartlett runs his experiment with different embodiments of an acoustic guitar. An inverse equalizer could be constructed with any of the difference curves for the

different embodiments of the acoustic guitar. As to claim 13, Bartlett discloses a microphone element placed proximate to an acoustical generator and Murayama et al teach an equalizer with at least first and second filter elements to compensate for the first and second differences in level between the miked sounds and reference sounds. Per claim 14, as explained above, it was obvious to attach the microphone to the acoustical generator. Regarding claim 15, it was obvious to use digital components at the time of invention as they were more reliable and faster. Per claims 28-30, variable controls exist in the form of the voltage current converters 32 and 33. As to claims 31 and 32, figure 2 of Murayama et al demonstrates that the graphic equalizer has a limited range of gain values. Regarding claims 36-38, it was obvious that the gain adjustment of one (first) filter element would be different from the gain adjustment of the other (second) filter element since the level differences vary in the signal spectrum as shown in the figures of Bartlett. As to claims 39-41, Q parameters differ among the first and second filter elements in the apparatus of Murayama.

(NOTE: There was a typographical error in the Final Office Action neglecting to include "36-41" in the first sentence of the rejection even though those claims were rejected in the body of the rejection)

(10) Response to Argument

With regard to claim 1, which is argued on pages 7-9 of the Appeal Brief, Appellant does not present convincing arguments that Bartlett and Murayama should not be combined. Bartlett individually teaches steps 1-6 of claim 1 and suggests the use of equalization in section 5 of the paper for making the close-miked acoustic guitar sound as it does at the 1 meter reference point. Appellant relies on <u>one suggestion</u> by Bartlett with regard to a steel-string guitar miked 80 mm

from the sound hole, that suggestion being a high pass filter with a cutoff frequency of 300 Hz, to demonstrate that such a filter would be difficult to implement using a graphic equalizer as taught by Murayama. Appellant also argues that sound quality would deteriorate using graphic equalizers because of overlapping regions of equalizer elements. However, these assertions are incorrectly based on the one suggested remedy for the unnatural sound produced by a closed-mike guitar. This remedy is only relevant to a specific instrument with a specific close-microphone distance. In fact, Bartlett teaches that the inverse of the spectral curves showing the difference between the generated sounds by the acoustic instrument picked up by a close microphone and the reference sounds at picked up by a microphone at 1 meter away from the instrument provide the exact equalization needed to make the close-miked sound more natural (page 731). The spectral curves show the level differences at different frequency points. If a single filter was used to compensate for the level differences in one specific frequency range, per the example given by Bartlett, a graphic equalizer would not be the best solution, as there would exist a plurality of frequency ranges not being corrected, which would be a misuse of the graphic equalizer and its complexity. A semi-parametric or parametric equalizer would be a viable solution for the one filter solution, however, the final rejection relies on the teaching that the inverse of the spectral curves shown in Bartlett show the **exact** equalization needed for improving the sound of a close-miked instrument and a graphic equalizer would be more appropriate for realizing the inverse of the curves. For a spectral curve like that of figure 11, there are two level differences, one at 100 Hz and one just over 1000 Hz, would are glaring. To one of ordinary skill in the art it would have been obvious that a single filter would not be the best solution to compensate for the differences between the generated sounds and the reference

sounds. A graphic equalizer with gain controls having center frequencies of 100 Hz and 1000 Hz (discrete) would be more suitable. Murayama taught a graphic equalizer having a plurality of band pass filters and voltage current converters which are used to sent gain in discrete frequency ranges. The band pass filters represent first and second filter elements which one of ordinary skill in the art would have used to compensate for level differences. In review, Appellant argues that the combination of Bartlett and Murayama would be difficult to implement and one would use a variable filter, however those assertions are based on one example in Bartlett. One of ordinary skill in the art would have realized that the high pass filter suggested by Bartlett was an intended solution for that specific instrument and microphone placement and that in general other filter configurations would be realized according to how the difference spectral curves are shaped, the filter configurations being easily put into practice using graphic equalizers.

With respect to the arguments of claim 5 on pages 9 and 10, Appellant does not specifically point out how the combination of Bartlett and Murayama does not read on the **claimed** invention. Specifically method steps 6 and 7 refer to replacing a first embodiment of the acoustical generator with a next embodiment and repeating steps 2-5 with the next embodiment. Method step 8 states that a tailor-made equalizer for the first microphone is constructed to compensate for differences between the sounds picked up by the microphone and reference sounds. This method step makes no reference to the use of different embodiments of the acoustical generator and comparing their sounds with reference sounds. However the argument presented by the Appellant is that "a device is created that may be easily adjustable for any instance in an instrument class". Examiner contends that such a device is not realized by claim 5. In its broadest interpretation, the claim merely recites the comparison of generated

sounds and reference sounds for a plurality of embodiments of an acoustical generator and constructing a tailor-made equalizer for the microphone based on one of the embodiments, which is disclosed by Bartlett. Murayama is relied upon for including an arrangement of tailored filter elements. A calibration function, as argued by Appellant, is not claimed and thus all arguments relating to such functionality are irrelevant. While Appellant does argue that the specific limitation of replacing the first embodiment of the acoustical generator with a next embodiment is not described by Bartlett, Examiner disagrees. Guitars are acoustical generators. Steel and nylon are different embodiments of the same type of acoustical generator. Appellant's assertion that "steel and nylon guitars are in many ways considered different instruments" implies that in some ways they are considered the same instrument. The difference in sound associated with said guitars bears no relevance to the claim language which calls for a next embodiment of an acoustical generator. Also, the argument made to Bartlett not referring to experimenting with multiple embodiments of an instrument type to gain the benefits as taught in claim 5 is not pertinent to the final rejected claim, as Bartlett discloses comparing sounds with multiple embodiments and the alleged benefit of claim 5 (as described by the Appellant) is not clearly demonstrated in the claim.

Regarding claim 13, Appellant has contradicted himself about the goal of the Bartlett reference. On page 11, it is asserted that the Bartlett is directed to experimenting with close microphone positions that most accurately approximate the reference sounds, while on page 12, Appellant cites a Bartlett passage stating "the intent of this report has been not to define the ideal microphone technique for a particular instrument, but rather to indicate the general tonal effects that can be expected in various close microphone positions". Clearly Bartlett is not concerned

with finding an optimal microphone position to approximate a reference sound, but is concerned with showing the effects of different close microphone positions and demonstrating the need for equalization in a close microphone situation. Appellant subsequently argues that the present invention eliminates the need to experiment with close microphone positions and simplifies using an equalizer to compensate for differences between the reference sounds and the close-miked sounds. Examiner disagrees. Claim 13 recites "a microphone element adapted to be placed at a specified selected location proximate to the acoustical generator" which is met by the Bartlett reference. The claim (or claim 1 for that matter) does not lead to choices for microphone placements that Bartlett would not consider possible, as alleged by the Appellant. It simply states that a microphone is placed at a specified location proximate to the acoustical generator, which is illustrated by any of the microphone placements in figures 2-15. The claim language does not call for choosing a location for the microphone among a plurality of locations for a specific intended effect. In the last paragraph on page 12 of the Appeal Brief and continuing onto page 13, Appellant argues that a fixed location is chosen so that a specialized processor would not have to compensate for sound quality problems that arise from microphone placements at other locations which implies that the prior art entails searching for the best microphone position and changing the processor accordingly to best approximate the reference sounds. However, as stated above, Bartlett is not directed toward searching for an optimal microphone positions. Bartlett discloses that for a certain microphone position, a specific equalization (the inverse of the spectral curves) must be used. One of ordinary skill in the art would naturally choose a microphone position and then use the spectral curve to equalize the sound. Experimentation is not suggested by the reference. In fact, experimentation is

contraindicated by the concluding paragraph on page 737 which states that an ideal microphone technique is not defined (or sought). The general teaching of Bartlett allows one of ordinary skill in the art to select one of the microphone positions and equalize it according to his/her taste, which is defined by the reference sounds. The choice of microphone position is irrelevant if equalization is used to compensate for differences.

Pages 13-17 are directed to a "General Discussion" of Bartlett of which several points are made to distinguish the key feature of embodiments of the present invention from Bartlett in combination with Murayama. However, Appellant makes invalid arguments about the subject matter of Bartlett while taking the teaching of the reference out of context. For example, it is asserted that Bartlett teaches an inferior solution by the disclosure on page 737, section 11. The passage is directed toward stating that the reference position has the most natural sound and a close microphone situation must be equalized. It does not state that a close-miked instrument is a solution to improving sound quality. Furthermore, the assertion that the present invention demonstrates that a result equal to the reference sounds can be obtained with a close-microphone placement which overcomes the limitation of Bartlett is false. Bartlett discusses that reference sounds can be obtained using an equalizer exhibiting the frequency response of the inverse of the illustrated spectral curves. The discussion of Bartlett is not limited to only using a microphone placed at 1 meter away from the acoustical generator. On page 14, Appellant alleges that Bartlett does not address the issue that the fixed position of the microphone must be accurate within inches. However, that feature is not present in any of the independent claims which only state that a microphone position must be selected. Once a microphone position is selected, it was obvious to one of ordinary skill in the art to construct an equalizer using an appropriate spectral

curve as plotted in Bartlett. Standard equalizers are only one solution proposed, but the rejection relies on the fact that the spectral curves themselves can be used to equalize the generate sounds to sound like the reference sounds. The last paragraph of page 14 of the Appeal Brief contends that no electrical design is proposed by Bartlett. Examiner disagrees. It was obvious to one of ordinary skill in the audio art that the act of equalization would have to be accomplished using an equalizer. Sound engineers are well versed in the use of the graphic equalizers taught by Murayama and it would not have been unreasonable to use a graphic equalizer to achieve the spectral curves illustrated by Bartlett to equalize a reference sound to a close-miked sound. On page 16 of the Appeal Brief, Appellant argues that those skilled in the audio art generally know nothing about constructing filters, they are only skill in the using whatever filters are available and that Bartlett is directed to using existing devices. To that point, Examiner disagrees that those skilled in the audio art do not know about constructing filters. Even if that statement is taken as fact, the assertion only strengthens the Examiner's position. The rejection proposes using an existing device, <u>a graphic equalizer</u>. An audio engineer is trained to use equalizers to achieve a desired sound. A desired sound would have been realized in a reasonable amount of time using the graphic equalizer of Murayama. Examiner is not re-interpreting Bartlett to the domain of design and construction, but rather using an existing equalizer (which is constructed according to its setting), which still reads on the claims. Appellant argues that Murayama does not teach an equalizer with first and second filter elements to compensate for the first and second differences in level between the miked sounds and reference sounds. However, Murayama is only relied upon for teaching first and second filter elements in an equalizer. The combination of Bartlett and Murayama introduces the step of compensation.

With regard to the arguments for claims 31 and 32, Appellant has not established the difference between Murayama and the claimed invention. On page 18, Appellant himself states that "any equalizer has a limited range of gain values, if for no other reason than infinite gain is impossible." It would have been obvious that the gain values of the equalizer elements of Murayama would include those to compensate for the level differences, otherwise the equalizer would be useless. For example, figure 6 of Bartlett indicates that attenuation on the order of several dB is required for equalizing the close microphone position of 8 cm from the neck to the reference sounds. One of ordinary skill in the art would have to use a graphic equalizer with at least that variability in gain to be effective. The combination of Bartlett and Murayama is based on the notion that one of ordinary skill in the art would use a graphic equalizer to accomplish the inverse of the spectral curves, therefore a graphic equalizer would be chosen based on the magnitude of the differences in the curves. The graphic equalizer would be limited in its gain.

With respect to the arguments of claims 36-38, Appellant argues that Bartlett only speaks of the need to make an adjustment but does not mention any device or potential range of adjustments. It is the Examiner's contention that the combination of Bartlett and Murayama yields forth the limitation. Specifically, the rejection of claims 1, 5, 13 (the respective parent claims) are based on the suggestion of Bartlett to use an equalizer to compensate for the difference of levels between the generated sounds and reference sounds of an acoustical generator. The graphic equalizer taught by Murayama, as discussed above, would be configured (in other words chosen) to attenuate or augment the close microphone signal for discrete frequency ranges suggested by the spectral curves. Using the same example of figure 6, it is shown that the compensated gain values are different for the frequency ranges around 100 Hz

and around 2000 Hz. Therefore, the graphic equalizer would have different gain adjustments for those frequency ranges. Under the broadest interpretation of the claim, a range of gain adjustment of the first filter element differs from a range of gain adjustment of the second filter element. Appellant is attempting to interpret the claims to read that the range of possible gain values used by the first filter element differs from the range of possible gain values used by the second filter element, but such language is not explicitly claimed.

Regarding claims 39-41, the graphic equalizer of Murayama is not perfect in its construction. Q parameter would differ among the band pass filters, as the circuit elements themselves present performance tolerances.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Brian T. Pendleton

Conferees:

Vivian Chin

VIVIAN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600
7/11/05

Sinh Tran

SINH TRAN
SUPERVISORY PATENT EXAMINER
7/11/05